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10/697,634	10/29/2003	Nobuhiro Takeda	1232-5187	7331

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EXAMINER	
HERNANDEZ, NELSON D	
ART UNIT	**PAPER NUMBER**
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/697,634	TAKEDA, NOBUHIRO	
	Examiner	Art Unit	
	Nelson D. Hernandez	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/26/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 7 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

3. **Claim 7** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. **Claim 7** recites the limitation "**the calculation device** has a calculation device" in lines 1-3. There is insufficient antecedent basis for this limitation in the claim. The

limitation of a calculation device is present in claim 6. For examining purposes claim 7 will be read as dependent from claim 6.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-4, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Shimoyama et al., US Patent 5,355,164.

Regarding claim 1, AAPA discloses an image sensing apparatus (Fig. 7) using an image sensing element (1a), comprising: a setting device which sets, in one image signal output from the image sensing element, a signal from a predetermined pixel region (effective area comprising photodiodes 1), and a reference signal (signal from the optical black region 6); a correction device (optical black clamping circuit 103) which uniformly DC-recovers signals from the predetermined pixel region on the basis of the reference signal set by said setting device (page 1, line 13 – page 5, line 17).

AAPA does not explicitly disclose a first reference signal for DC recovery and a first correction device, which DC-recovers the signal from the predetermined pixel region for each row on the basis of the first reference signal set by said setting device.

However, Shimoyama et al. teaches an image sensing apparatus (Fig. 4) using an image sensing element (Fig. 4: 1), comprising: a setting device which sets, in one image signal output from the image sensing element, a signal (effective image signal from region RP as shown in fig. 5) from a predetermined pixel region, a first reference signal for DC recovery (from blind pixels BC as shown in fig. 5; col. 3, line 45 – col. 4, line 11), and a second reference signal (from dummy pixels DC as shown in fig. 5; col. 3, line 45 – col. 4, line 11); a first correction device which correct the signal from the predetermined pixel region for each row on the basis of the first reference signal set by said setting device (Shimoyama et al. teaches performing dark current correction to the image signal based on the signal values from the blind pixels (Col. 3, line 45 – col. 6, line34)); and a second correction device which uniformly correct the signals from the predetermined pixel region on the basis of the second reference signal set by said setting device (Shimoyama et al. teaches performing dark current correction to the image signal based on the signal values from the dummy pixels (Col. 3, line 45 – col. 6, line34; see also col. 1, line 54 – col. 2, line 18)). Shimoyama et al. also discloses that although the invention has been described for a linear sensor, the concepts taught can also be applied to an area sensor (Col. 5, lines 12-16).

Therefore, taking the combined teaching of AAPA in view of Shimoyama et al. as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shimoyama et al. by using a reference (first) signal for DC recovery and a first correction device, which DC-recovers the signal from the predetermined pixel region for each row on the basis of the first reference signal set by

said setting device. The motivation to do so would have been to accurately correct dark current signals from the image signal wherein when measurement errors occur in the blind pixels output of a certain line due to noise, its influences are minimized and streaks can be prevented from occurring as suggested by Shimoyama et al. (Col. 5, lines 17-34).

Regarding claim 2, the combined teaching of AAPA in view of Shimoyama et al. as discussed and analyzed in claim 1 teaches that the first reference signal includes a signal free from influence of a signal converted by a photoelectric conversion element of the image sensing element (See Shimoyama et al., signal from blind pixels, Col. 3, line 45 – col. 6, line34; see also col. 1, line 54 – col. 2, line 18), and the second reference signal includes a signal containing a dark current component generated in the photoelectric conversion element of the image sensing element (See AAPA, signals from optical black region 6; Shimoyama et al., signals from dummy pixels DC). Grounds for rejecting claim 1 apply here.

Regarding claim 3, the combined teaching of AAPA in view of Shimoyama et al. as discussed and analyzed in claim 1 teaches that the second reference signal includes a signal obtained in a region which includes the photoelectric conversion element in the image sensing element and is shielded from incident light (See AAPA, signals from optical black region 6; Shimoyama et al., signals from dummy pixels DC). Grounds for rejecting claim 1 apply here.

Regarding claim 4, the combined teaching of AAPA in view of Shimoyama et al. as discussed and analyzed in claim 1 teaches that the first reference signal includes a

signal obtained in a region which does not include the photoelectric conversion element in the image sensing element (See Shimoyama et al., blind pixels BC as shown in fig. 5; col. 3, line 45 – col. 4, line 11). Grounds for rejecting claim 1 apply here.

Regarding claim 9, AAPA discloses an image sensing apparatus (Fig. 7) comprising: a photoelectric conversion region which includes two-dimensionally arrayed photoelectric conversion elements (See fig. 7); and a correction device (optical black clamping circuit 103) which corrects the signal from the photoelectric conversion region on the basis of a reference signal (signal from the optical black region 6) common to signals from the two-dimensionally arrayed photoelectric conversion elements, wherein the reference signal contains a dark current component generated in the photoelectric conversion element (page 1, line 13 – page 5, line 17).

AAPA does not explicitly disclose a first correction device which corrects a signal from the photoelectric conversion region on the basis of a first reference signal common to each line, wherein the first reference signal includes a signal free from influence of a signal generated by the photoelectric conversion element.

However, Shimoyama et al. teaches an image sensing apparatus (Fig. 4) using an image sensing element (Fig. 4: 1), comprising: a setting device which sets, in one image signal output from the image sensing element, a signal (effective image signal from region RP as shown in fig. 5) from a predetermined pixel region, a first reference signal for DC recovery (from blind pixels BC as shown in fig. 5; col. 3, line 45 – col. 4, line 11), and a second reference signal (from dummy pixels DC as shown in fig. 5; col. 3, line 45 – col. 4, line 11); a first correction device which correct the signal from the

predetermined pixel region for each row on the basis of the first reference signal set by said setting device (Shimoyama et al. teaches performing dark current correction to the image signal based on the signal values from the blind pixels (Col. 3, line 45 – col. 6, line34)); and a second correction device which uniformly correct the signals from the predetermined pixel region on the basis of the second reference signal set by said setting device (Shimoyama et al. teaches performing dark current correction to the image signal based on the signal values from the dummy pixels (Col. 3, line 45 – col. 6, line34; see also col. 1, line 54 – col. 2, line 18)). Shimoyama et al. also discloses that although the invention has been described for a linear sensor, the concepts taught can also be applied to an area sensor (Col. 5, lines 12-16).

Therefore, taking the combined teaching of AAPA in view of Shimoyama et al. as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shimoyama et al. by having a first correction device which corrects a signal from the photoelectric conversion region on the basis of a first reference signal common to each line, wherein the first reference signal includes a signal free from influence of a signal generated by the photoelectric conversion element. The motivation to do so would have been to accurately correct dark current signals from the image signal wherein when measurement errors occur in the blind pixels output of a certain line due to noise, its influences are minimized and streaks can be prevented from occurring as suggested by Shimoyama et al. (Col. 5, lines 17-34).

Regarding claim 10, limitations can be found in claim 3.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Shimoyama et al., US Patent 5,355,164 and further in view of Ookawa, US Patent 6,353,223 B1.

Regarding claim 5, the combined teaching of AAPA in view of Shimoyama et al. fails to teach that the first reference signal includes a signal output from a reference power supply for each row of the predetermined pixel region.

However, Ookawa teaches the concept of using a voltage source (Fig. 1; 18) as a reference voltage to correct the image signal form noises generated from temperature changes (Col. 1, line 8 – col. 3, line 18).

Therefore, taking the combined teaching of AAPA in view of Shimoyama et al. and further in view of Ookawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify AAPA and Shimoyama et al. by using a voltage source to supply a reference signal for each row of the predetermined pixel region. The motivation to do so would have been to correct the image data accordingly to noise changes due to temperature as suggested by Ookawa (Col. 1, line 8 – col. 3, line 18).

8. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Shimoyama et al., US Patent 5,355,164 and further in view of Ide at al., US Patent 6,304,292 B1.

Regarding claim 6, the combined teaching of AAPA in view of Shimoyama et al. as discussed and analyzed in claim 1 teaches that the second correction device has a

storage device which stores the signal from the predetermined pixel region (See AAPA, page 2, line 18 – page 3, line 9) but fails to teach a calculation device which calculates a representative value of the second reference signal (optical black signal), and a subtraction device which subtracts the representative value of the second reference signal that is calculated by the calculation device.

However, Ide et al. teaches an imager (See fig. 1: 12 and fig. 10), comprising an optical black detection area (See fig. 10) and an effective pixel area (See fig. 10), wherein the signal values from the optical black detection area are averaged by a clamp level calculation circuit (Fig. 9: 50) and the averaged values of the signals from the optical black detection area are subtracted for the image signal (Col.6, line 53 – col. 7, line 36; col. 9, line 14 – col. 10, line 31).

Therefore, taking the combined teaching of AAPA in view of Shimoyama et al. and further in view of Ide et al. as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify AAPA and Shimoyama et al. by having a calculation device which calculates a representative value of the second reference signal (optical black signal), and a subtraction device which subtracts the representative value of the second reference signal that is calculated by the calculation device. The motivation to do so would have been to prevent the black level deviation from occurring as suggested by Ide at al. (Col. 2, lines 52-63).

Regarding claim 8, limitations can be found in claim 6.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Shimoyama et al., US Patent 5,355,164 and further in view of Abe, US Patent 6,700,609 B1.

Regarding claim 7, the combined teaching of AAPA in view of Shimoyama et al. fails to teach that the calculation device has a calculation device which calculates representative values of the second reference signal for a plurality of regions obtained by dividing the region which includes the photoelectric conversion element in the image sensing element and is shielded from incident light, and a device which outputs to the subtraction device a lowest value among the representative values of the plurality of regions that are calculated by the calculation device.

However, Abe teaches an imaging apparatus (Fig. 3), comprising an image sensor (Fig. 3: 1), said image sensor comprising an optical black region (Fig. 1: 21), wherein said optical black region is divided into a plurality of regions (every line has a black portion which is compared to other black portion of the adjacent lines, this teaches dividing the black region into a plurality of black portions), and wherein the vale of the black region corresponding to a line is compared to another black region corresponding to an adjacent line to find an absolute difference between the values (this is read as a representative value), wherein the absolute difference is compared to a predetermined value and if the absolute value is lower that the predetermined value, said absolute value would be used to correct the image signal by sending the average clamp level to a subtracter to subtract it from the image signal and if is larger than the predetermined value the clamp level would be updated (Col. 3, line 60 – col. 5, line 48).

Therefore, taking the combined teaching of AAPA in view of Shimoyama et al. and further in view of Abe as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify AAPA and Shimoyama et al. by having a calculation device which calculates representative values of the second reference signal for a plurality of regions obtained by dividing the region which includes the photoelectric conversion element in the image sensing element and is shielded from incident light, and a device which outputs to the subtraction device a lowest value among the representative values of the plurality of regions that are calculated by the calculation device. The motivation to do so would have been to improve the image sensing apparatus by correcting the dark current for each row thus flicker is avoided as suggested by Abe (Col. 6, lines 9-24).

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernandez whose telephone number is (571) 272-7311. The examiner can normally be reached on 8:30 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571) 272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nelson D. Hernandez
Examiner
Art Unit 2622

NDHH
May 11, 2007

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